Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Wireless E911 Location	)	PS Docket No. 07-114
Accuracy Requirements	)	

REPLY COMMENTS OF PRECISION BROADBAND LLC

Precision Broadband LLC respectfully submits these reply comments in response to the Commission's March 15, 2019 *Fourth Further Notice of Proposed Rulemaking* (*Fourth FNPRM*) to improve wireless E911 vertical, or z-axis, location accuracy.[1] Precision Broadband submitted its initial comments to this proceeding on May 20, 2019.[2]

I. SUMMARY

The 2015 Fourth Report and Order (*Fourth R&O*) established the criteria for vertical location as "either (1) dispatchable location, or (2) z-axis technology that achieves the Commission-approved z-axis metric."[3]

The current *Fourth FNPRM* primarily seeks to determine if a ±3 meter benchmark for the z-axis location, as demonstrated in the test bed, should be adopted as the "Commission-approved z-axis metric." Secondarily, the *Fourth FNPRM*, paragraph 28 asks, "can CMRS providers achieve dispatchable location and complete work on the NEAD on an accelerated timeframe? If

[1] *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, Fourth Further Notice of Proposed Rulemaking, FCC 19-20 (March 15, 2019) [Hereinafter, *Fourth FNPRM*].
[2] Comments of Precision Broadband LLC, PS Docket No. 07-114 (filed May 20, 2019), *available at* https://ecfsapi.fcc.gov/file/1052037980575/Precision%20Broadband%20Comments-PS%2007-114%202019-5-20%20.pdf. [Hereinafter, PBB Comments]
[3] *Wireless E911 Location Accuracy Requirements*, PS Docket No. 07-114, para 6 (February 3, 2015) [Hereinafter, *Fourth R&O*]

not, should the Commission decouple the choice of deploying z-axis technology from dispatchable location, and how would bifurcating CMRS providers' technology choice impact CMRS providers' incentives to deploy dispatchable location and complete work on the NEAD?"

The focus of our reply comments is on the questions regarding dispatchable location and the NEAD. In short,

1. Based on reports from the CTIA and the detailed analysis we provided in our initial comments to this proceeding, there is no evidence to suggest that the NEAD alone will be a sufficient source of dispatchable location; and
2. We believe there should be a multi-faceted, holistic approach to solving the vertical location problem. Therefore, we strongly urge the Commission to **not** decouple the choice of deploying z-axis technology from dispatchable location.

II. DISCUSSION

A. No consensus on a vertical location solution

Based on the comments submitted to the *Fourth FNPRM*, it is apparent that there is no agreement among experts regarding the near-term readiness of barometric pressure sensor-based technology for 911 use, ability of PSAPs and first responders to use the z-axis location data in practice, or whether z-axis is an effective substitute for dispatchable location. As Qualcomm commented, "The record in this proceeding demonstrates that no solution has been fully validated, so multiple simultaneous avenues to providing improved location accuracy of indoor E911 callers should continue to be pursued."[4]

[4] Comments of Qualcomm Incorporated, PS Docket No. 07-114 (filed May 20, 2019), *available at* https://ecfsapi.fcc.gov/file/10520232251429/Qualcomm%20Comments%20on%20FNPRM.pdf

Commenters are divided into three camps:

Recommendation	Supporters
Implement Z-axis 3-Meter Metric. • As demonstrated in the test bed and dependent upon supported handsets only. No floor level required.	CTIA, Verizon, AT&T, T-Mobile, NENA, ATIS, Texas Emergency Services, International Association of Firefighters, Boulder Emergency Tel Service Authority, Polaris and NextNav
Incremental, phased approach with minimal metric or no metric specified. • Technology is not mature enough for 911.	Google and Qualcomm
Floor level specified.	APCO and Precision Broadband

For the many reasons presented in its comments, we strongly support APCO International's position that, "The proposed [z-axis] metric will not serve as an effective backstop to dispatchable location and will not meet the Commission's goal '[t]o ensure that first responders and Public Safety Answering Points (PSAPs) can find 911 callers quickly and accurately when a consumer calls from a multi-story building.'… The proposed z-axis metric fails to account for public safety operations and would be difficult to enforce."[5]

APCO further recommends that, "If a z-axis metric is approved, it must include a floor number." This offers an optimal *belt and suspenders* solution proposed by Precision Broadband in its comments by combining both a z-axis metric and dispatchable location.[6]

B. The NEAD alone cannot support a dispatchable location requirement

The requirement for dispatchable location in the *Fourth R&O* is grounded in the NEAD. The sole compliance criteria specified for vertical dispatchable location is that the NEAD "must

[5] Comments of APCO International, PS Docket No. 07-114 (filed May 20, 2019), *available at* https://ecfsapi.fcc.gov/file/10520362223970/APCO%20z-axis%20comments%20May%202019%20Final.pdf

[6] See footnote 2, PBB Comments, Page 17. Section V, 5.

be populated with a total number of dispatchable location reference points in the CMA equal to 25 percent of the CMA population."[7]

Precision Broadband provided a detailed analysis of the NEAD's limitations in our initial comments to the *Fourth FNPRM*, some of which is repeated here.[8]

First, only Android mobile devices support the functionality required by the NEAD today,[9] not the Apple iPhone (half of smartphones in the U.S.)[10] This is not a trivial limitation, however, it appears that only Apple can resolve this issue.

Second, the number of location reference points (i.e. WiFi access points with civic addresses) in the NEAD is inconsequential and may never be meaningful. According to the CTIA, the wireless carriers have supplied all 25 million reference points in the NEAD to-date, and have acknowledged difficult challenges in obtaining reference points from third-parties (i.e., cable operators).[11] In our initial comments, we provided an in-depth explanation of these challenges and why they are unlikely to ever be overcome.[12]

Finally, even if the NEAD contained reference points equal to 25 percent of the CMA population, that alone does not provide any assurance that a meaningful number of vertical locations are covered, nor does it address the aforementioned iPhone exclusion.

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[7] See *Fourth R&O*, paragraphs 6, 30, and APPENDIX D para2, (i), (2), ii, (C), (1)
[8] See PBB Comments, Section V,2 on page 13 for an analysis of the NEAD limitations.
[9] *E911 Location Test Bed Dispatchable Location Summary Report.* Prepared by ATIS Test Bed Program Management.https://ecfsapi.fcc.gov/file/104260730612217/190425%20911%20Loc%20Tech%20Test%20Bed%20LLC%20Aggregated%20NEAD%20Based%20DL%20Summary%20Report.pdf (April 2019)
[10] http://gs.statcounter.com/os-market-share/mobile/united-states-of-america . (Last reviewed May 19, 2019.)
[11] CTIA ex-parte letter April 26, 2019. https://ecfsapi.fcc.gov/file/104260730612217/190426%20CTIA%20NEAD%20Dispatchable%20Location%20Report%20Ex%20Parte.pdf
[12] See footnote 8

Given what is now known about the NEAD, we believe that the criteria for dispatchable location in the *Fourth R&O* is no longer satisfactory. If it is concluded that the NEAD alone is not a viable option for dispatchable location, then other options must be considered, or consequently, we are only left with the z-axis metric for vertical location. This cannot be an acceptable result. To quote APCO, "Adopting the proposed z-axis metric [only] would be a bad outcome for public safety." Therefore, we respectfully request that the Commission address the dispatchable location standard and the z-axis metric together.

III. RECOMMENDATIONS

Precision Broadband wishes to defer the original recommendations expressed in our comments to the *Fourth FNPRM* for now,[13] and respectfully recommends the following:

1. That a dispatchable location, including floor and unit, be required for all wireless 911 calls from multi-story locations along with a Commission-approved z-axis metric. Thus, dispatchable location and z-axis should not be an "either/or" choice as currently stated in the *Fourth R&O*. See the Appendix for suggested amendments to the *Fourth R&O*.
2. That the technical definition of dispatchable location, along with relevant measureable compliance criteria, be changed from the current NEAD to also encompass other location databases. See the Appendix for suggested amendments to the *Fourth R&O*.
3. Lastly, the wireless carriers alone cannot provide a comprehensive solution for dispatchable locations. They need access to other sources of location data that they do not own or control in order to truly impact public safety.

To this end, Precision Broadband further proposes that the Commission institute a new rulemaking proceeding that specifically addresses source location data for 911 and

[13] See PBB Comments, Section III.

similar public safety purposes. This new proceeding should specifically include entities such as facilities-based Internet Service Providers (ISPs) and device operating system vendors (i.e., Apple, Google, Microsoft, Amazon, etc.) that provide communications services and technology to consumers, and also own, create, capture and/or maintain location data of their customers. Precision Broadband's recommendations in our original comments to the *Fourth FNPRM* are most relevant to such a proceeding.[14]

IV. CONCLUSION

Precision Broadband appreciates the opportunity to provide these reply comments and respectfully requests that the Commission seriously consider our recommendations.

We welcome the opportunity to discuss our comments further with the Commissioners and Commission staff.

June 7, 2019

Respectfully submitted,

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[14] See footnote 14

Appendix – Suggested Amendments to Fourth R&O

Regarding recommendations 1 & 2 in Section III, herein, we offer the following suggested amendments (crossed-out red text replaced with underlined text) to the "Vertical Location" language currently in Part 20 of the Code of Federal Regulations.

See *Fourth R&O*, Final Rules, Appendix D, Section 2. (i),(2),ii, (C).[15]

"(C.) Within 6 years: In each of the top 25 CMAs, nationwide CMRS providers shall deploy ~~either~~ both (1) dispatchable location, ~~or~~ and (2) z-axis technology in compliance with any z-axis accuracy metric that has been approved by the Commission,

(1) In each CMA ~~where~~ for dispatchable location ~~is used~~: nationwide CMRS providers must ensure that all smartphones manufactured after **20xx** must be supported, and ~~the NEAD~~ that validated and corroborated location databases ~~is~~ are populated with a sufficient number of total dispatchable location reference points located in at least ~~to equal 25~~ **xx** percent of the ~~CMA population~~ total occupied residential dwelling units located in building structures with three or more floors and **xx** percent of the total occupied commercial units located in building structures with three or more floors. For example, such dispatchable location reference points may include, but are not limited to: (1) WiFi access points and Bluetooth beacons in the NEAD; (2) unique fixed broadband connections identified by Internet Service Provider (ISP)-provisioned customer premise gateways such as cable modems, DSL modems, fiber-to-the-premise devices (Optical Network Terminals or connected routers), and fixed-wireless connected modems or routers; (3) locations created from crowd-sourced technology; and (4) locations identified in multi-story building blueprints that can be used to provide reference data capable of converting a vertical z-axis measurement into an actual floor level.".

(2) In each CMA ~~where~~ for z-axis technology ~~is used~~: nationwide CMRS providers must deploy z-axis technology to cover 80 percent of the CMA population.

(D.) Within 8 years: In each of the top 50 CMAs, nationwide CMRS providers shall deploy ~~either~~ both (1) dispatchable location ~~or~~ and (2) such z-axis technology in compliance with any z-axis accuracy metric that has been approved by the Commission."

[15] See also *Fourth R&O* paragraphs 6 and 30 where similar language is repeated.

Also, for completeness and clarification purposes in the official rules, we suggest the inclusion of "floor" and "unit" in the definition of "Dispatchable Location" in Part 20 of the Code of Federal Regulations.

See *Fourth R&O*, Final Rules, Appendix D, Section 2

> *"(1) Definitions*: The terms as used in this section have the following meaning:
> i. *Dispatchable location*: A location delivered to the PSAP by the CMRS provider with a 911 call that consists of the street address of the calling party, plus additional information such as floor, suite, apartment, unit, or similar information necessary to adequately identify the location of the calling party. The street address of the calling party must be validated and, to the extent possible, corroborated against other location information prior to delivery of dispatchable location information by the CMRS provider to the PSAP."